CAMBRIDGE SYSTEMATICS

Funding and Financing Feasibility

ADOT Corridor Definition Studies

technical

memorandum

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Cambridge Systematics, Inc.

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1.0 Introduction

1.1 WILLIAMS-GATEWAY PROJECT DESCRIPTION

This technical memorandum presents funding and financing alternatives for new corridors identified as part of the Arizona Department of Transportation's (ADOT) Corridor Definition Studies. The technical memorandum was developed as part of the Williams Gateway Corridor Definition Study, but addresses general funding and finance issues throughout the joint study area for all three studies. The Corridor Definition Studies have been conducted by ADOT to further define a set of transportation corridors originally identified by the Southeast Maricopa/Northern Pinal County Transportation Study (SEMNPTS), conducted jointly by the Maricopa Association of Governments (MAG) and the Central Arizona Association of Governments (CAAG). Figure 1.1 presents the SEMNPTS corridors and the general location of ADOT's Corridor Definition Study.

1.2 POPULATION AND EMPLOYMENT GROWTH

As part of the three definition studies, a travel demand model was developed to evaluate the impact of new facilities on the transportation system. Existing and future socioeconomic estimates were generated as the basis of these evaluations. Table 1.1 presents the existing and future population estimates for the Pinal County portion of the study area.[1] Figure 1.2 presents population density in the study area and the corridors recommended for further study from the three Corridor Definition Studies.

1.3 PROJECT COST

The cost to construct the recommended corridors identified as part of the Corridor Definition Studies is substantial. Table 1.2 identifies the total cost as $1,640 million, including system interchanges from the Williams Gateway to the North-South and U.S. 60 corridors. Details on the construction cost estimates for each project can be found in the respective working papers for the studies.

[1] Note that only a portion of Pinal County is included in the study area.

Figure 1.1 ADOT Corridor Definition Studies Joint Study Area

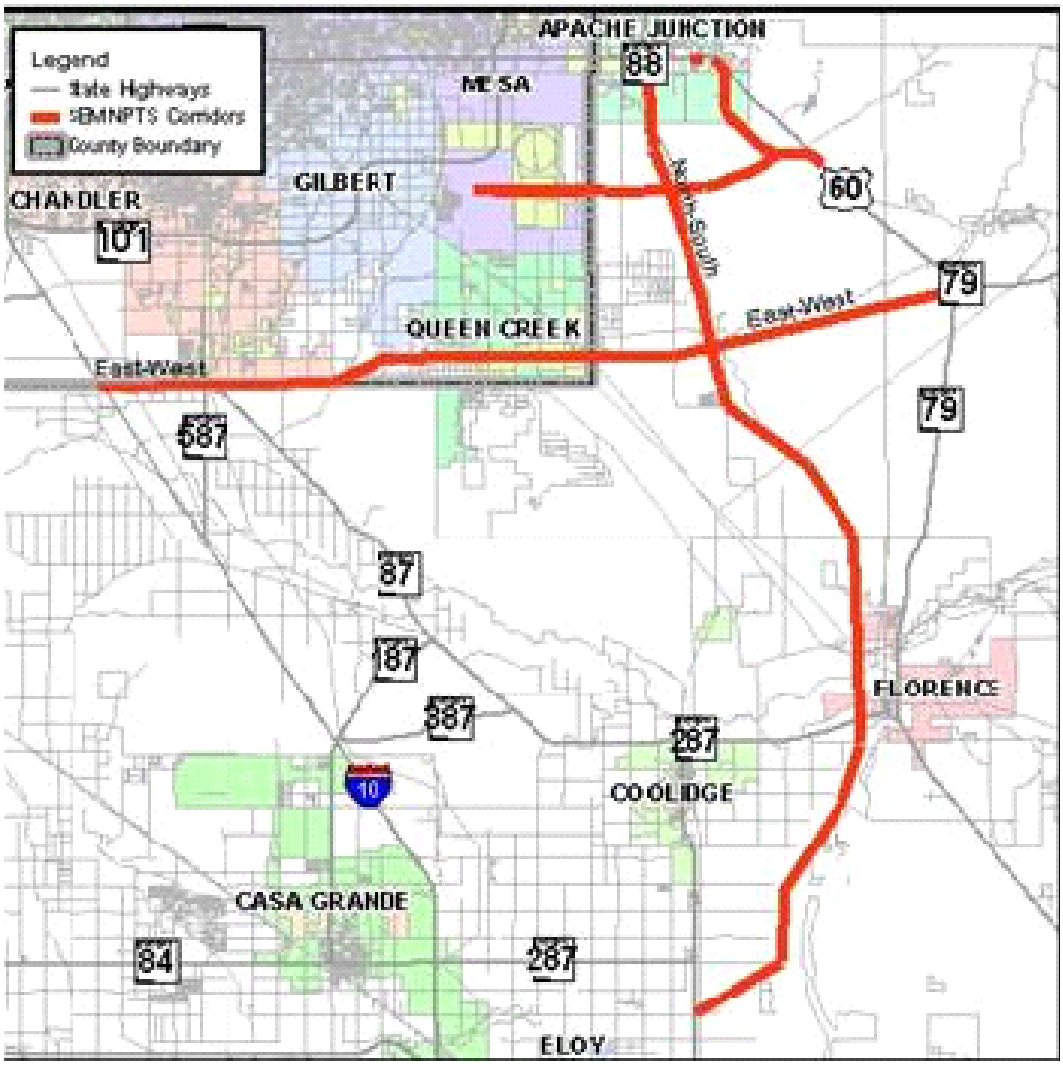
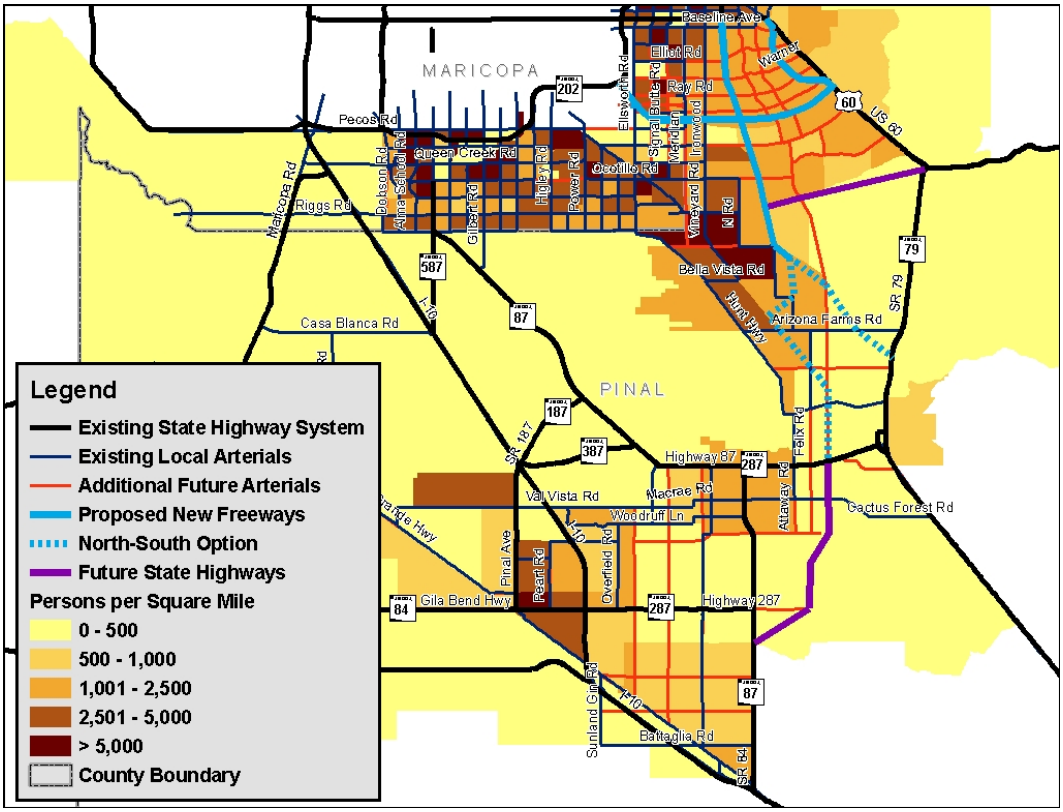


Table 1.1 Existing and Future Socioeconomic Conditions

	2005	2030
Population	252,000	1,089,000
Employment	49,000	300,000

Source: Cambridge Systematics, Inc., 2005.

Figure 1.2 Population Density and Study Recommendations



Source: Cambridge Systematics, Inc., 2005.

Table 1.2 Corridor Definition Study Project Cost

Item	Description	Miles	Cost ($ Millions)
Williams Gateway	Meridian to U.S. 60	10	381
North-South	U.S. 60 to SR 79	23	916
U.S. 60	U.S. 60 Reroute	7.2	302
U.S. 60	Existing U.S. 60 – MP 205 to MP 212	7.2	79
System TI	Williams and North-South		150
System TI	Williams and U.S. 60		100
System TI	North-South and U.S. 60		100
Total			2,028

Source: Cambridge Systematics, Inc., 2005; Kimley-Horn & Associates, 2005; and Lima & Associates, 2005.

1.4 OTHER PROJECTS IN PINAL COUNTY

In addition to the capital costs identified as part of the Corridor Definition Studies, other major capital projects have been identified within Pinal County. Two projects were identified as part of the Long-Range Transportation Plan (MoveAZ):

1. **Widening I-10 to six lanes between Tucson and Phoenix.** The Pima and Maricopa County portions of this widening already are funded. The Pinal County portion of the widening (over 50 miles) was estimated to cost $163 million.
2. **Widening SR 87 to four lanes between SR 387 and Coolidge.** This seven-mile-long project was estimated to cost $38 million.

These numbers are for capital costs only, and do not include ongoing operations and maintenance expenses. The maintenance and preservation of roadways in Pinal County are not addressed here. In addition, these estimates were generated prior to significant recent increases in construction costs.

2.0 Existing Funding Sources

This section describes the existing sources of Federal and state funds that are available to fund highway transportation projects in Arizona. This section also describes county and local funding sources that are available for transportation projects specifically in Pinal County. Many, but not all, of these sources could potentially be used to finance the recommended freeway corridors in Pinal County.

2.1 FEDERAL FUNDING

Table 2.1 provides FY 2005 to FY 2009 Federal funding estimates of highway apportionments for the State of Arizona by funding category. These funds are available to fund highway projects throughout the State, subject to the appropriate Federal guidelines and application procedures for each category. Funds that are not obligated to a particular project may be withdrawn by the Federal government.

Table 2.1 Federal Highway Apportionments for Arizona

Category	2005	2006	2007	2008	2009
Interstate Maintenance	96.7	98.2	99.8	101.4	103.1
National Highway System	105.6	107.3	109.1	110.8	112.6
Surface Transportation Program	119.7	108.9	110.2	111.9	113.7
Bridge Replacement and Rehabilitation	14.4	14.6	14.8	15.1	15.3
Congestion Mitigation and Air Quality	32.4	32.9	33.5	34.0	34.6
Recreational Trails	1.3	1.5	1.6	1.7	1.9
Metropolitan Planning	5.7	5.6	5.7	5.8	5.9
Safety	–	19.7	20.1	20.5	20.9
Rail-Highway Crossings	–	2.6	2.6	2.6	2.6
Border Infrastructure Program	6.0	7.1	8.1	9.3	10.3
Safe Routes To School	1.0	1.6	2.1	2.6	3.3
High-Priority Projects	23.9	23.9	23.9	23.9	23.9
Equity Bonus	212.7	195.5	222.4	239.0	237.5
Total of All Programs	619.5	619.7	654.0	678.7	685.5
Percentage of National Total	1.8%	1.8%	1.8%	1.8%	1.8%

Source: http://www.fhwa.dot.gov/safetealu/fundtables.htm.

Of these Federal categories, the ones that are likely to be most relevant to funding the recommended freeway corridors in Pinal County are:

- **National Highway System (NHS).** These funds are used for improvements to rural and urban roads that are part of the NHS, including the Interstate System and designated connections to major intermodal terminals.
- **Surface Transportation Program (STP).** These funds are a flexible source that may be used by states and localities for projects on any Federal-aid highway, including the NHS, bridge projects on any public road, and transit capital projects.
- **Equity Bonus.** These funds are additional funds distributed to ensure that each state will be guaranteed a minimum rate of return on its share of contributions to the Highway Trust Fund and a minimum increase relative to the average dollar amount of apportionments under the Transportation Equity Act for the 21st Century (TEA-21).

Growth rate projections in Federal funds vary by category; the NHS and the STP categories have an annual average growth rate of 1.6 percent from FY 2006 to FY 2009. Projections of how much Federal funding could be available to support the Pinal County corridor projects are provided in Section 4.0.

In addition to the Federal highway funds shown in Table 2.1, the State of Arizona also is projected to receive $71.2 million in Federal funds for transit in FY 2006, increasing to a projected $86.8 million in FY 2009.[2] These funds are restricted to public transportation purposes only, and, as such, would not be available to finance the recommended freeway corridors in Pinal County.

2.2 STATE FUNDING

The Highway User Revenue Fund (HURF) is the primary state-level funding source available for highway projects in Arizona.[3] HURF revenues are generated from a several state taxes and fees, including gasoline and fuel taxes (state tax rates are 18 cents per gallon on gasoline and 26 cents per gallon on diesel fuel), a portion of the vehicle license tax (44.99 percent), motor carrier taxes, motor vehicle registration fees, border crossing fees, and other miscellaneous fees.

A small amount of HURF funds is set aside for the ADOT Motor Vehicle Division, Department of Public Safety, and the Economic Strength Project Fund (used for a priority list of highway projects to improve economic well-being). Arizona Revised Statues (Title 28, Section 6538) specify a formula to distribute the remaining HURF funds throughout the State.

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[2] http://www.fhwa.dot.gov/safetealu/fundtables.htm.

[3] http://www.azdot.gov/Inside_ADOT/fms/hurflink.asp.

Just over half (50.5 percent) of HURF funds go into the State Highway Funds. The remainder is distributed to cities (30.5 percent) and counties (19 percent) to pay for local road needs. In FY 2006, Pinal County and cities within the County will receive over $20 million from HURF. Funds are distributed among cities and counties based on population and gasoline sales. Of the funds for the state highway fund, roughly 85 percent are discretionary. The remainder are provided to urban areas (Maricopa and Pima Counties).

The HURF funding pool is projected to grow to $1.9 billion in FY 2014, a growth rate of over 50 percent from the 2005 funding level. Continued growth in the HURF fund can be expected through 2030. As the size of the HURF fund grows and the population of Pinal County increases, both Pinal County itself and the cities/towns in Pinal County can be expected to receive significantly more HURF funds over time. These funding projections are provided in Section 4.0.

In addition to HURF funds, a small portion of the vehicle license tax (5.85 percent) is distributed to counties for highway purposes. These revenues are distributed based on unincorporated population. In FY 2006, roughly $47 million will be available to Pinal County from this source. Currently, much of the growth in Pinal County is taking place in unincorporated areas. As these areas grow, Pinal County will receive more of this funding source. If these areas incorporate, as the City of San Tan has recently pursued, funding from this source could drop.

Funding projections that could potentially be used for Pinal County corridor projects are provided in Section 4.0.

2.3 COUNTY/LOCAL FUNDING IN PINAL COUNTY

Sales Tax

Arizona legislation enables counties to adopt a special retail sales privilege tax, or an excise tax, specifically for transportation purposes.[4] Adopting such an excise tax requires voter approval and generally may be as high as 0.5 percent. Pinal County is one of three counties in Arizona (the others being Gila and Maricopa) with a one-half-cent transportation sales tax. This tax was adopted by Pinal County voters in 1986 to provide additional funding for the construction, maintenance, and repair of roads and bridges throughout the County. The tax became effective in January 1987 and was extended by voters for an additional 20 years in November 2005.

[4] *Local Option Transportation Taxes in the United States, Part II: State by State Findings*, University of California at Berkeley, March 2001, page 27.

The Pinal County's one-half-cent sales tax generated $9.8 million in FY 2004, up nearly 50 percent from the $6.6 million that was generated in FY 2000.[5] Currently, the cities and towns in Pinal County collectively receive about 60 percent of the tax revenue, and the County itself receives the remaining 40 percent. Section 3.1 provides revenue projections of the one-half-cent sales tax.

Note that Pinal County's one-half-cent sales tax is in addition to a general one-half-cent sales tax in Pinal County (the Pinal County Excise Tax), state sales tax revenue distributed to Pinal County and to individual cities within the County, and municipal privilege taxes that apply in particular cities in Pinal County. Revenue estimates for each of these general sales taxes (which are not dedicated to transportation) are described at the end of Section 3.1.

Other Transportation Revenue Mechanisms

Counties in Arizona are allowed to adopt property taxes dedicated to roadway projects. In addition, cities and counties may establish special taxing districts for roads and parking facilities. Most of the ones that have been established have the authority to issue bonds. Transportation development fees are another option that cities in Arizona can utilize. These fees are gaining popularity among cities in Pinal County.

Apache Junction. In December 1996, the City of Apache Junction adopted a development fee for roads and other public services and started collecting revenues in March 1997. The fee is a one-time upfront charge that applies to all new residential, retail, office, and industry developments, and is made at the time of the building permit approval. The development fee revenues are used to cover the costs of capacity expansion improvements to the City's major roadway system, as well as other purposes, including police, parks, libraries, and municipal buildings.[6]

In 2001, Duncan Associates prepared a Development Fee Update Study that provided actual revenue amounts obtained from the Apache Junction's development fee, and then calculated changes to the development fee structure (i.e., potential maximum development fees) on the basis of a detailed demand and cost methodology for various types of public services.

Table 2.2 shows the actual Apache Junction development fee revenue obtained from 1997 to 2000.

[5] Arizona Department of Revenue Annual Report, page 36.

[6] Development Fee Update Study for City of Apache Junction, Duncan Associates, December 2001.

Table 2.2 Apache Junction Development Fee Revenues
1997 to 2000

Facilities	1997	1998	1999	2000
Roads	$103,015	$167,436	$238,299	$188,020
Police	$45,654	$117,438	$158,182	$91,429
Parks	$98,058	$253,875	$482,861	$108,401
Library	$38,544	$120,543	$263,171	$58,941
Municipal Buildings	$0	$32,439	$70,938	$41,104
Total	$285,271	$691,731	$1,213,451	$487,895

Source: Duncan Associates, 2001, *Development Fee Update Study for City of Apache Junction*, December, page 2.

During the four-year time period, the amount of Apache Junction's development fee revenue going to roads varied from a low of around $100,000 in 1997 to a high of nearly $240,000 in 1999. The percentage of total development fee revenues going to roads varies from a low of around 20 percent in 1999 to a high of just under 40 percent in 2000.

Table 2.3 shows the results of the maximum development fee structure analysis. For roads, the amount was calculated on the basis of a formula that used variables, including cost and vehicle-miles traveled.

The study proposed significant increases in the development fee structure for roads from $270 currently charged per single-family unit to a potential maximum of $1,485 per single-family unit (an increase of 450 percent).

Table 2.4 shows a comparison made (for single-family units) between Apache Junction's current development fee structure, Apache Junction's proposed maximum development fee structure, and the development fee structure of cities in Maricopa County.

Table 2.3 Summary of Maximum Development Fees for Apache Junction

Facility Type	Single-Family Unit	Multifamily Unit	Mobile Home Unit	Retail 1,000 Square Feet	Office 1,000 Square Feet	Industry 1,000 Square Feet
Maximum Fees						
Roads	$1,485	$1,029	$747	$3,859	$1,709	$1,082
Police	$133	$128	$102	$325	$226	$157
Parks and Open Space	$564	$542	$434	$0	$0	$0
Libraries	$262	$252	$202	$0	$0	$0
Municipal Buildings	$83	$80	$64	$203	$141	$98
Total Maximum Fees	$2,527	$2,031	$1,549	$4,387	$2,076	$1,337
Current Fees						
Roads	$270	$183	$136	$846	$469	$197
Police	$118	$114	$91	$364	$230	$130
Parks	$366	$352	$283	$0	$0	$0
Libraries	$199	$191	$154	$0	$0	$0
Municipal Buildings	$53	$51	$41	$164	$103	$58
Total Current Fees	$1,006	$891	$705	$1,374	$802	$385
Potential Change						
Roads	450%	462%	449%	356%	264%	449%
Police	13%	12%	12%	-11%	-2%	21%
Parks and Open Space	54%	54%	53%	NA	NA	NA
Libraries	32%	32%	31%	NA	NA	NA
Municipal Buildings	57%	57%	56%	24%	37%	69%
Total	151%	128%	120%	219%	159%	247%

Source: Duncan Associates, 2001, *Development Fee Update Study for City of Apache Junction*, December, page 3.

Table 2.4 Comparative Development Fees Per Single-Family Unit in Arizona

Facility	Phoenix	Mesa	Scottsdale	Chandler	Gilbert	Glendale	Apache Junction	
							Current	Proposed
Water	$3,444	$907	$2,696	$2,060	$1,346	$542	$921	$921
Wastewater	$1,781	$1,059	$2,356	$2,047	$2,314	$1,367	$2,000	$2,000
Roads	$3,752		$906	$1,537	$86	$2,003	$270	$1,485
Fire	$142	$145		$105	$127	$311		
Police	$93	$226		$159	$47	$289	$118	$133
Parks/Open Space	$1,503	$696		$680	$705	$1,094	$366	$564
Library	$276	$378		$68		$452	$199	$262
Gen. Government				$231	$178	$660	$53	$83
Other[a]	$430	$228				$264		
Total	$11,421	$3,639	$5,958	$6,887	$4,803	$6,982	$3,927	$5,448

Source: Duncan Associates, 2001, Development Fee Update Study for City of Apache Junction, December, page 4.

Note: Table includes $2,921 in Apache Junction's development fees for waste and wastewater, imposed in parts of the City by independent community facilities districts that was not identified in the earlier tables.

[a] Residential development tax and cultural facilities for Mesa, equipment repair and solid waste for Phoenix; sanitation for Glendale, and Peoria.

The maximum proposed Apache Junction's development fee for roads of $1,485 is still significantly less than the $3,752 development fee for roads in Phoenix and the $2,003 fee for roads in Glendale.

Casa Grande. The City of Casa Grande has recently conducted a study to update its development fee schedule. Similar to the fee in Apache Junction, the Casa Grande development fees are one-time payments on new development. The development fee is assessed per housing unit for residential units and per thousand square feet of floor area for nonresidential developments. The revenue from the development fees is used to pay for the cost of capacity expansion improvements for various types of public services, including transportation, sewers, libraries, parks and recreation, police, fire and emergency medical, and general government.[7]

Tischler & Associates, Inc. recently calculated the maximum supportable development fees for Casa Grande on the basis of applying a detailed demand and cost calculation methodology for various types of public services. Table 2.5 shows the results of this analysis.

For transportation, the amount was calculated by multiplying trip generation rates with the net capital cost per trip. Such fees only relate to transportation capital costs, not to operations or maintenance costs. The calculated maximum transportation development fee amount for a single-family home in Casa Grande of $1,464 is very similar to the $1,485 roads amount that was calculated for a single-family home in Apache Junction. The document did not provide estimates of actual development fee revenue that has been collected in Casa Grande.

Eloy. The City of Eloy is in the process of conducting a development fee study. As with the Cities of Apache Junction and Casa Grande, the development fee would include one-time payments for every new development in the City.[8] The development fee is expected to be adopted in March 2006, and the fee revenues will be used for roadway improvements.

Queen Creek. The City of Queen Creek has recently approved a development fee for transportation improvements.[9] As with the cities previously described, the fee also is a one-time payment that is assessed by the municipality, and the charge is based on trip generation rates by type of development and net capital cost per unit of trip capacity.

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[7] Development Fee Study for the City of Casa Grande, Tischler & Associates, Inc., March 2004.

[8] Finance Department, City of Eloy, November 2005.

[9] Development Fees, City of Queen Creek, Tischler & Associates, Inc., March 2003.

Table 2.5 Schedule of Maximum Supportable Development Fees in Casa Grande

	Community Services (Library, Parks and Recreation)	Police	Fire/EMS	Transportation	General Government	Total
Residential (per unit)						
Single Family Detached	$2,767	$266	$556	$1,464	$659	$5,712
All Other Housing Types	$1,947	$187	$391	$735	$463	$3,723
Nonresidential (per 1,000 sq. ft)						
Com/Shop Center 25,000 square feet or less	N/A	$872	$581	$7,527	$561	$9,541
Com/Shop Center 25,001-50,000 square feet	N/A	$805	$498	$6,946	$482	$8,731
Com/Shop Center 50,001-100,000 square feet	N/A	$701	$436	$6,049	$421	$7,607
Com/Shop Center 100,001-200,000 square feet	N/A	$604	$387	$5,211	$374	$6,576
Com/Shop Center over 200,000 square feet	N/A	$515	$348	$4,451	$337	$5,651
Office/Inst 10,000 square feet or less	N/A	$401	$765	$3,463	$740	$5,369
Office/Inst 10,001-25,000 square feet	N/A	$324	$704	$2,801	$681	$4,510
Office/Inst 25,001-50,000 square feet	N/A	$276	$661	$2,385	$639	$3,961
Office/Inst 50,001-100,000 square feet	N/A	$235	$622	$2,030	$602	$3,489
Office/Inst over 100,000 square feet	N/A	$200	$584	$1,728	$565	$3,077
Business Park	N/A	$226	$551	$1,952	$533	$3,262
Light Industrial	N/A	$123	$403	$1,066	$389	$1,981
Warehousing	N/A	$87	$223	$758	$215	$1,283
Manufacturing	N/A	$67	$317	$584	$307	$1,275

Source: Tischler & Associates, Inc., 2004, *Development Fee Study for the City of Casa Grande*, March, page 3.

3.0 Potential Funding Sources

Five potential funding mechanisms for ADOT and Pinal County to consider that are of particular promise and relevance are described in this section:

1. General or transportation-dedicated sales tax. Both of these are present in Pinal County; the one-half-cent Pinal County transportation excise tax was renewed for 20 years in November 2005.
3. General or transportation-dedicated property tax. While general property taxes are used in Pinal County, these are not dedicated for transportation purposes.
4. Benefit assessment districts (property tax in a designated district).
5. Traffic impact fees.
6. Tolling.

For each item, estimates are provided regarding how much funding could be generated today and through the year 2030. These estimates were developed to provide general guidance, and do not represent guaranteed funding that would be available if used for these facilities. The estimates are intended to provide an order of magnitude regarding these funds, not specific amounts. This is followed by a discussion of potential debt financing options in Arizona.

3.1 SALES TAX

Sales taxes are taxes that are levied as a percentage of the sales price of goods and services. With a general sales tax, the revenue generated is treated as general revenue for the designated agency or jurisdiction. In addition to having a general sales tax, many state and local governments around the country also have sales taxes in place that are dedicated towards funding highway, transit, and other infrastructure improvements. Dedicated transportation sales taxes in Arizona are allowed by Arizona Revised Code 9-240 and 42-6013.[10]

The main advantages of sales taxes include:

- **Automated Inflation Adjustment.** Sales tax revenue rises automatically with price inflation.
- **Equity.** Sales taxes are linked directly with commodity value, making them somewhat equitable. Those who purchase more goods and services pay

[10] *Local Option Transportation Taxes in the United States, Part II: State by State Findings*, University of California at Berkeley, March 2001, page 27.

more in sales taxes. However, sales taxes on basic goods (food, clothing, etc.) have a disproportionate impact on the poor.

The main disadvantages of sales taxes include:

- **Economic Fluctuations.** Purchases of goods and services respond to fluctuations in the national and regional economy. As such, the amount of sales tax revenue could change significantly from year to year, making long-term forecasting unreliable.
- **Weak Transportation Linkage.** Sales taxes have only limited linkage to usage of the transportation system. Those who purchase more goods and services do not necessarily use the transportation system more heavily.

Table 3.1 provides a list of states with county- or local-level sales taxes that are dedicated towards roads, as of March 2001. With an estimated 68 percent of the population taxed at estimated annual per capita revenues of $77.10, Arizona is among the states with the most extensive use of sales taxes dedicated to roadways at the county and local level.

As discussed above, Pinal County recently renewed its half-cent transportation sales tax for the next 20 years. Between 1987 and 2004, this tax generated $95 million. In 2004, the tax generated $9.8 million, of which 60 percent went to the cities and towns in Pinal County and 40 percent went to the county itself. Projections to 2030 were estimated using the following methodology:

1. Total retail employment was estimated for 2030 in support of the Pinal County Planning Model. Socioeconomic forecasts are described in the *Pinal County Planning Model Socioeconomic Estimates and Forecasts Technical Memorandum*.

7. The retail employment forecast was converted to a stream (year over year) using the Bond Feasibility estimates of population growth in five-year bands.

8. Retail sales per employee were estimated using Woods & Poole data. These are given in 1996 dollars and are for every five years. These were converted to 2005 dollars using an inflation factor of 1.25 from the Bureau of Labor Statistics' Commodity Price Index.

9. Retail sales per employee also were converted to a year-by-year stream by using a steady growth rate between the five-year periods.

10. Current year values were based on the Arizona Department of Revenue Annual Report, 2005.

11. Future values were calculated by multiplying the stream of retail employment by the stream of retail sales per employee.

12. The 60/40 split was used to estimate the percent that would likely be available to the County and to the cities and towns collectively, assuming that the sales tax is continued through 2030.

Table 3.2 shows the results of this analysis.

Table 3.1 Selected States with Dedicated Sales Taxes for Roads

State [a]	Vote Required?	Areas Imposing Tax	Percentage of Population Taxed	Annual Per Capita Revenues[b]
Alabama	No	Roads: 3 counties	3%	$22.80
Arizona	Yes	Roads: 4 counties, 3 cities	68%	$77.10
Arkansas	Yes	Roads: 34 counties, 17 cities	35%	N/A
California	Yes	Multimodal: 13 counties Roads: 3 counties, 1 town	49% 3%	$59.50 $41.50
Colorado	Yes	Roads: 15 counties, 10 cities	>46%	$58.20
Florida	Yes	Multimodal: 6+ counties	>23%	$41.80
Georgia	Yes	Roads: More than _ of counties	>25%	$112.00
Iowa	Yes	Roads: 21 of 99 counties	23%	$50.00
Kansas	Yes	Roads: 2 counties, 8+ cities	>13%	N/A
Louisiana	Yes	Roads: 7 parishes, 1 city	29%	$60.50
Minnesota	Yes	Roads: 1 city	2%	$32.60
Missouri	Yes	Roads: 40+ counties, 8 cities	32%	$96.20
Nebraska	Yes	Roads: 1+ cities	> 1%	N/A
Nevada	Yes	Roads: 4 counties Railroads: 2 counties	6% 18%	$29.50 $18.40
New Mexico	Yes	Roads: 8+ counties, 20 cities	40%	$6.60
New York	No	Roads: 1 county	<1%	$15.40
Ohio	Yes	Roads: 5+ counties	> 3%	$59.30
Oklahoma	Yes	Roads: 17 counties	N/A	N/A
South Carolina	Yes	Roads: 2 counties	7%	$150.60
Tennessee	Yes	Roads: 9 counties	21%	$7.40
Utah	Yes	Roads: 19 cities	8%	$13.10
Wyoming	Yes	Roads: 3 counties	14%	?

Source: University of California at Berkeley, 2001, *Local Option Transportation Taxes in the United States, Part I: Issues and Trends*, March, page 15.

[a] Information was not available for North Dakota, South Dakota, and Texas. Alaska, Montana, Pennsylvania, Vermont, and Washington do not allow counties or cities to impose additional sales tax for roads.

[b] Per capita revenue for the percent of the population taxed.

These estimates are more conservative than the estimates used by Pinal County officials. These officials estimate initial revenues around $15 million in 2006, growing to as much as $91 million by 2025, roughly double the level expected from the above analysis. Receipts from the existing half-cent sales tax (between 1987 and 2004) were short of projections by about $50 million ($95 million received, $145 million projected).

Table 3.2 Estimated Pinal County Transportation Sales Tax Receipts (*Year 2005 Dollars*)

Years	Available to Pinal County	Available to Cities and Towns	Total Projected Receipts	Average Annual Projected Receipts
2006-2010	$27,578,000	$41,367,000	$68,945,000	$13,789,000
2011-2015	$41,036,000	$61,553,000	$102,589,000	$20,518,000
2016-2020	$61,076,000	$91,615,000	$152,691,000	$30,538,000
2021-2025	$87,581,000	$131,371,000	$218,952,000	$43,790,000
2026-2030	$117,224,000	$175,836,000	$293,060,000	$58,612,000
Total	$334,495,000	$501,742,000	$836,237,000	$33,449,000

Source: Cambridge Systematics, Inc., 2005.

By comparison, the Regional Area Road Fund (RARF) one-half-cent sales tax in Maricopa County is projected to generate $1,232.5 million in the year 2025.[11] The year 2025 RARF revenue projection is roughly 25 times greater than the 2025 Pinal County one-half-cent sales tax revenue projection of $49.6 million, which reflects the continued disparity in projected retail activity between the two counties. A potentially relevant question over the long term is whether the Phoenix metropolitan area, as it continues to grow, should be defined as a multicounty region in the future – and, therefore, whether the county- and local-level funding for the region as a whole should be combined together and viewed as a regional funding pool.

In addition to the one-half-cent transportation sales tax measures, other potential tax options that could be considered include:

- Using more general tax revenue at the state, county, and/or local levels for transportation projects. This could include state sales tax, municipal sales tax, and state income tax. Over $100 million in sales taxes were collected in Pinal County in FY 2004. These funds currently are used for a wide variety of government services.
- Increasing the state gasoline tax (currently $0.18 per gallon) and/or the diesel fuel tax (currently $0.26 per gallon). Arizona has the 36th highest gas tax rate among the 50 states (Rhode Island is first at $0.30 per gallon), but the 8th highest diesel fuel tax rate (Pennsylvania is first at $0.308 per gallon).[12] For the Arizona Long-Range Transportation Plan, it was estimated that an additional 5 cent gasoline tax, indexed to inflation, would produce roughly $2 billion (inflation adjusted) over the course of the plan (2005-2025). Pinal

[11] http://www.azdot.gov/Inside_ADOT/fms/rarflink.asp.

[12] http://www.fhwa.dot.gov/policy/ohim/hs04/hf.htm.

County's share of any additional gas tax would depend on the current and future distribution of HURF revenues.

- Implementing a state sales tax that is dedicated to transportation. A state sales tax dedicated to transportation would likely supersede similar taxes at the local level. However, it is not the intent of this memorandum to describe how funds would be allocated from a local sales tax or to speculate on the future of existing local sales taxes. The revenue potential for a statewide sales tax would be the same as estimated for the local tax above.
- Implementing a county/local gasoline and diesel fuel tax that applies to sales within particular jurisdictions. County and other local gasoline taxes currently are not currently permitted by Arizona state statute. In 2003, roughly 130 million gallons of gasoline were consumed in Pinal County. A one cent local tax would have produced around $1.3 million. If Arizona state law was changed to allow for local gas taxes, the total amount would increase. Assuming that gasoline consumption increased in step with population, total funding from a local gas tax could amount to as much as $7 million in 2030.[13]
- Implementing other dedicated transportation retail taxes, such as a vehicle transfer tax. Vehicle transfer taxes are levied at the time of initial vehicle sale. They are in addition to sales tax collected on the vehicle.

3.2 PROPERTY TAX

Property taxes are taxes that are levied on a periodic basis as a percentage of property owned within a particular area or jurisdiction. Property taxes are typically collected at the state or local level. While property taxes solely dedicated to transportation are not common, doing so in the State of Arizona is allowed by Arizona Revised Code 28-6712.[14] Such taxes are limited to fund county highways and roads (not state or local roadways), and are limited to $0.50 per $100 in assessed value.

The main advantages of property taxes include:

- **Magnitude.** Property tax revenue is often the most significant source of revenue available at the local level.
- **Acceptance.** Property taxes are accepted nationwide as a standard means for the public sector to generate funds.

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[13] Actual amounts received from a local gas tax would depend greatly on a number of external factors, including the fuel efficiency of future automobiles, the volume of through traffic in Pinal County that stops for gas, and others. This analysis is intended to provide only a rough sense of the magnitude of such a tax.

[14] *Local Option Transportation Taxes in the United States, Part II: State by State Findings*, University of California at Berkeley, March 2001, page 27.

The main disadvantages of property taxes include:

- **Fluctuations.** Property values on a regional or local level can change significantly over time. While the long-term trend is expected to be upwards, there are likely to be periods of time when property values will flatten out or decline. As with sales tax revenue, the long-term forecasting of property tax revenue is inherently unreliable.
- **Modest Transportation Linkage.** Property taxes have only some linkage to usage of the transportation system. Those who own a higher value of property do not necessarily use the transportation system more heavily. While the residents and business owners in Pinal County are expected to make some of their travel within Pinal County, they also will make some of their travel outside the County. Furthermore, many residents and business owners outside of Pinal County make some of their travel within the County.

In 2004, the Arizona Department of Revenue estimates that Pinal County collected $125.9 million in general primary property tax revenue (property tax rate of 11.86 percent) and $42.4 million in general secondary property tax revenue (property tax rate of 3.75 percent).[15] There currently are no transportation-dedicated property taxes in Pinal County.

Overall, Arizona uses property taxes less for dedicated transportation purposes than many other states. A 2001 study of property tax in 17 states showed that the areas of Arizona with a dedicated property tax for roads generated roughly $15.30 per capita from property taxes within those areas. Two-thirds of the states in the study had higher per capita property tax collections for roads, including Washington ($106.40), Nevada ($82.60), and others.[16]

In 2004, Pinal County had roughly 215,000 residents.[17] A 0.3 percent property tax collection (or $0.30 per $100 of assessed value) would have been required to generate the average level of $15 per capita for transportation attained in other parts of the State. The total revenue from this tax would have been about $3.2 million, based on the net assessed property valuation of $1.06 billion in Pinal County that year from the Arizona Department of Revenue.

If a 0.3 percent transportation-dedicated property tax in Pinal County were adopted, it would generate roughly $26.4 million (year of expenditure dollars) by the year 2030. This assumes a 4.0 percent average annual growth in property values per capita in Pinal County and a 4.3 percent average annual population growth rate from the Pinal County Planning Model. Housing sales price data for the Phoenix metropolitan area indicates that while the annual growth in property

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[15] *2004 Annual Report*, Arizona Department of Revenue, November 2004, pages 74-75.

[16] *Local Option Transportation Taxes in the United States, Part I: Issues and Trends*, University of California at Berkeley, March 2001, page 12.

[17] http://www.census.gov/popest/datasets.html.

values has been double digits during the past couple years, the historical average annual growth rate (in noninflation adjusted dollars) from 1987 to 2003 was 4.1 percent.[18]

Table 3.3 presents estimated property tax revenue from a 0.3 percent property tax dedicated to transportation.

Table 3.3 Estimated Receipts from a 0.3 Percent Property Tax
(Year of Expenditure Dollars)

	Projected Receipts	
Years	Total	Average Annual
2006-2010	$22.2 million	$4.4 million
2011-2015	$33.3 million	$6.7 million
2016-2020	$50.0 million	$10.0 million
2021-2025	$75.1 million	$15.0 million
2026-2030	$112.8 million	$22.6 million
Total	$293.5 million	$11.7 million

Source: Cambridge Systematics, Inc., 2005.

More revenue could be generated from a higher tax rate or by using general property tax revenue for transportation purposes.

3.3 BENEFIT ASSESSMENT DISTRICTS

Benefit (or special) assessment districts are property taxing districts where the cost of infrastructure is paid for by properties that are deemed to benefit from the addition of that infrastructure. The assessment rate need not be uniform throughout the designated district; properties that are deemed to receive greater benefit may pay a higher rate. These assessments can be applied to the full value of the subject property, or use a Tax Increment Financing (TIF) technique, in which bonds are issued to finance public infrastructure improvements and are repaid with dedicated revenues from the incremental property taxes that result from making such improvements. The infrastructure improvements are assumed to encourage redevelopment, which in turn increases the value of

[18] *The Phoenix Metropolitan Housing Study*, Arizona State University, W.P. Carey School of Business, 2006: http://wpcarey.asu.edu/seid/arec/data.cfm?table=sales and *Greater Phoenix Housing Market*, November 2005, slide 18: http://www.elliottpollack.com.

surrounding property. The use of benefit assessment districts in Arizona is allowed by Arizona Revised Code 48-572.[19]

The main advantages of benefit assessment districts are:

- **Economic Efficiency.** By internalizing the infrastructure costs that are directly related to new developments, benefit assessment districts promote economic efficiency.
- **Direct Benefit Linkage.** Costs that would otherwise be funded through other sources are shifted to a group of property owners in return for the property value benefit as a result of the new infrastructure.
- **Equity.** Fees or assessments on new development have often helped to convince the electorate to support state or local sales tax initiatives because voters see that new development will be paying its fair share.

The main disadvantages of benefit assessment districts are:

- **Reliability.** The property value benefits that are assumed to result from an infrastructure project are not a given and depend heavily on trends in the real estate market.
- **Modest Transportation Linkage.** As with property taxes, benefit assessment districts for the purposes of transportation projects will have only a modest linkage to usage of the transportation facilities.

A number of states utilize special assessment districts for transportation purposes, including Alaska, Florida, Iowa, Nevada, North Carolina, Oregon, and Rhode Island.[20] However, there are limited resources available for accurately projecting the revenue that would result from implementing new benefit assessment districts, given that both the specific rules and the local conditions of existing assessment districts vary so widely from case to case.

3.4 TRAFFIC IMPACT FEES

Traffic (or transportation) impact fees, typically administered at the local level, consist of one-time charges to developers on new development to account for increased demand on the transportation system. Revenues obtained from traffic impact fees are used to pay for transportation infrastructure improvements resulting from the growth generated by new development. Traffic impact fees are often set to pay for improved transportation infrastructure in a local

[19] *Local Option Transportation Taxes in the United States, Part II: State by State Findings*, University of California at Berkeley, March 2001, page 27.

[20] *Local Option Transportation Taxes in the United States, Part II: State by State Findings*, University of California at Berkeley, March 2001.

community that comes about as a result of new development. Traffic impact fees differ from benefit assessment districts, which are not one-time charges and are typically implemented on the basis of a different justification. Traffic impact fees are a more specialized subset of development fees, which are more generic in scope and are used to pay for a broader range of public services, including sewers, parks, schools, libraries, police, and fire/medical emergency services.

The main advantages of impact fees:

- **Equity.** Provides a measure of equity as developers pay a fee related to a fair share of the infrastructure that they require.
- **Win-Win Approach.** Can attract developer support in communities where developers fear that without the fees important infrastructure cannot be supplied in a timely fashion.
- **Slow Growth.** Alternatively, can be used as a means to slow growth by raising the price of that growth to new households and businesses.

The main disadvantages of impact fees:

- **Complexity.** The administering agency may need to conduct a nexus study to determine a proportional fee structure that precisely captures the relationship between the development impacts and the amount of fees.
- **Limited Reliability.** Revenue from this source is unpredictable and cannot typically be bonded. Though such fees have sometimes been used as a component of financing large projects, they are typically used for more locally oriented improvements.
- **Modest Transportation Linkage.** Developers pay for the roadway improvements, which are passed onto the property owners. For a major highway, there is, therefore, only a modest linkage to the actual roadway users.

As discussed in Section 2.3.2, four cities in Pinal County (Apache Junction, Casa Grande, Eloy, and Queen Creek) are in various stages of researching and implementing development fees. Only the report prepared for Apache Junction has documented revenue estimates from such fees available, as provided in Table 2.2. For roads, this amount averaged about $174,000 for roads annually between 1997 and 2000.

The studies conducted for both Apache Junction and Casa Grande indicate that a development fee for transportation of about $1,500 for a single-family home is considered reasonable (with varying amounts for other types of homes and non-residential property). Assuming that such a development fee structure was implemented countywide, roughly $6.4 million could be generated for transportation purposes, growing to about $70.6 million in 2030. These are rough estimates that would fluctuate significantly on a year-to-year basis, depending on the timing and pattern of development. The estimates are based on the following assumptions and calculations:

- Apache Junction has roughly 15 percent of the total population in Pinal County,[21] and is assumed to have about 15 percent of the county's development activity. Therefore, the total county's revenue potential is about 6.7 times higher than the city of Apache Junction.
- The $1,500 transportation development fee for a single-family home is about 5.5 times higher than the existing Apache Junction fee of $270.
- The combination of these factors indicates that a countywide transportation development fee of $1,500 for a single-family home in the year 2005 could generate about 37 times the revenue of the $174,000 annual average that is being generated in Apache Junction – or about $6.4 million,
- The development fee would keep pace with an assumed annual inflation rate of 3.0 percent (reaching a year of expenditure amount of about $3,140 for a single-family home in the year 2030), and the county population would grow by a factor of about 5.27 times between the years 2005 and 2030 according to the Pinal County Planning Model. Based on a geometric growth rate assumption, Pinal County's year 2030 development activity would be about 5.27 times more than in the year 2005. This yields a year of expenditure revenue estimate of about $70.6 million in the year 2030.

3.5 TOLLING

Tolling involves charging a toll to use a highway, bridge, or tunnel. Tolls may be collected at toll plazas, and increasingly also are being collected using tickets, electronic transponders, or video recording of license plates. Many existing traditional toll roads are converting to some form of electronic toll collection, and most new toll projects incorporate the option to pay electronically.

Toll prices may be set at a flat rate, or also may be varied depending upon the time of day, day of week, and/or real-time traffic conditions in order to appropriately manage demand. In the case of varying toll prices, prevailing market conditions dictate what the tolls should be (i.e., traffic volumes and willingness to pay). Tolls may be collected from all drivers, usually with the exception of emergency vehicles. Alternatively, certain vehicle classes may be exempt from paying tolls, such as 2+ or 3+ high-occupancy vehicles (HOV), transit buses, motorcycles, and/or hybrid vehicles.

The funds generated from tolling are typically used to support the construction, operations, and maintenance of highway projects. Toll facilities are typically financed with bonds backed by dedicated revenue streams, which allows facilities to be constructed earlier.

[21] http://www.census.gov/popest/datasets.html.

The main advantages of tolling:

- **Direct Transportation Linkage.** Tolls are direct user fees (i.e., users of the roadway pay for the roadway).
- **Traffic Management.** In addition to revenue generation, tolling also provides a tool with respect to the management of traffic congestion. Tolls, especially when varied by time of day, impact driver behavior by encouraging drivers to shift trips to off-peak periods and discouraging some trips altogether.
- **Flexibility.** With the advent of new technology, toll prices can be readily changed without the same legislative requirements as other revenue sources.
- **Revenue Reliability.** Traffic volumes typically grow over time and are not as strongly affected by changes in the economy as other revenue sources. Therefore, the revenue generated from tolling will be relatively reliable with steady growth from year to year.

The main disadvantages of tolling:

- **Costs.** Higher upfront costs for the tolling infrastructure, equipment, operations, maintenance, and enforcement.
- **Regressive.** Tolling may be viewed as regressive, particularly when compared to property taxes.
- **Traffic Delays.** Delays at the toll booths, in the case of traditional non-electronic toll collection. Given the likely opening date of the new corridors analyzed here, it is unlikely that toll booths would be used. Newer technologies allow for electronic toll collection that eliminates the need for toll booths.

Congestion Pricing

The conventional application of tolling involves collecting tolls at all traffic lanes of a road, bridge, or tunnel. More recently, an increasing number of tolling applications has the primary objective of managing traffic demand, with revenue generation as a secondary objective. Typically referred to as congestion pricing or value pricing, this approach can be applied to roads, bridges, tunnels, or managed lanes.

The congestion-pricing application of managed lanes involves designated toll lanes adjacent to toll-free lanes on the same roadway. Drivers then have the option to pay for the toll lanes (in order to obtain travel time savings), or use the toll-free lanes instead. Three particular types of priced managed lanes are described as follows:

- **Lane, High-Occupancy Toll (HOT).** A lane situated next to a regular highway lane that is open to HOVs (and sometimes motorcycles as well) without a toll and also to single-occupancy vehicles (SOV) with payment of a toll. The HOT lane concept grew out of the recognition that some traditional HOV

lanes were underutilized. HOT lanes currently are present in several locations throughout the United States, including Los Angeles, San Diego, Houston, Denver, and Minneapolis.

- **Lane, Express Toll.** A lane situated next to a regular highway lane that is open to all personal automobiles with payment of a toll. The difference from the HOT lane approach is that HOVs are not exempt from the toll (although transit vehicles and/or registered vanpools may be exempt). Though these lanes typically represent added highway capacity, existing toll-free lanes also could be converted to express toll lanes. Express toll lanes also could be located adjacent to traditional toll roads, but employ variable pricing to maintain a higher level of service.
- **Lane, Truck-Only Toll (TOT).** A lane situated next to a regular highway lane that is open to trucks only with payment of a toll. Frequent passing lanes and staging yards near cities or major highway junctions could be provided. Separating truck traffic from auto traffic could improve traffic speeds, as well as safety, by separating vehicles with different operating characteristics into separate traffic streams.

With any of these managed lane applications, the appropriate toll amount may be determined according to actual real-time traffic volumes in order to best manage congestion (i.e., variable pricing or dynamic pricing).

The advantage of priced managed lanes from the user perspective is travel time savings. As such, the feasibility of a proposed priced managed lane project is dependent on local conditions that include the amount of traffic congestion and the availability of alternate routes. If traffic volumes are low or if uncongested alternate toll-free routes are readily available, priced managed lanes are not likely to be successful, because the travel time savings from using these lanes will be limited.

Other Tolling Considerations

In addition to cost, traffic, and revenue projections, other key factors that should be taken into account when considering new tolling facilities are:

- **Social Equity and Public Attitudes.** What is the public perception of tolling in the region? Is tolling considered to be equitable from a geographic and a socioeconomic perspective?
- **Organization.** What agency will operate, maintain, and enforce toll roads? What level of government and geographic jurisdiction is appropriate?
- **Technology.** What is the most cost-effective technology available to allow for the desired toll policies to be implemented?
- **Legislative Support.** How will support for tolling projects among the appropriate elected officials be secured?

Tolling Feasibility in Northern Pinal County

Working Paper #2 of the Williams Gateway Corridor Definition Study provided year 2030 traffic volume projections for several scenarios. Three scenarios were used for the purpose of this analysis:

1. **Base Future.** Limited roadway improvements;

13. **Enhanced Future.** Widened arterials; and

14. **Refined All Corridors.** Construction of the Williams Gateway Freeway, the North-South Freeway, and the U.S. 60 Reroute in Pinal County.[22]

The key finding from the Refined All Corridors scenario was that almost all of the corridor segments and arterial streets in the study area would operate below capacity in the year 2030. In that context, three main tolling options for the Refined All Corridors scenario are proposed for further consideration:

1. Toll all lanes for all the recommended corridors. An evaluation of this option is provided to follow.

15. Establish HOT lanes on the west segment of the Williams Gateway Freeway (from the Pinal County line to the North-South Freeway) and the south segment of the North-South Freeway (south of the Williams Gateway Freeway), where the traffic volumes are projected to be relatively high.

16. Construct all recommended corridors as toll-free lanes. Construct new HOV or HOT lanes as additional capacity once certain segments consistently operate over capacity during the weekday peak periods.

It should be noted that if only some of the corridors are constructed, the projected traffic volumes on both the freeways and the arterials will be higher than the Refined All Corridors scenario. This will make the use of tolling a more viable option from a congestion pricing perspective.

Projected Tolling Revenue

Table 3.4 shows projections of year 2030 tolling revenue based on a $0.10 toll per mile per automobile (all lanes in both directions) for the Williams Gateway Freeway, the North-South Freeway, and the U.S. 60 Reroute. The total is $48 million for all five segments.

[22]The Refined All Corridors scenario was used in this analysis because it most closely reflects the final recommendations of the three Corridor Definition Studies, which were based on a combination of the scenario analysis and public and stakeholder involvement.

Table 3.4 2030 Revenue from Auto Toll of $0.10 Per Mile

	Williams Gateway, West	Williams Gateway, East	North-South, North	North-South, South	U.S. 60 Reroute
Segment Endpoint 1	County Line	North-South	U.S. 60	Williams Gateway	Baseline Avenue
Segment Endpoint 2	North-South	U.S. 60	Williams Gateway	SR 79	Williams Gateway
Length (Miles)	3.02	4.51	4.68	6.29	4.64
Auto Toll Per Mile	$0.10	$0.10	$0.10	$0.10	$0.10
Truck Toll Per Mile[a]	$0.20	$0.20	$0.20	$0.20	$0.20
Total Auto Toll	$0.30	$0.45	$0.47	$0.63	$0.46
Total Truck Toll	$0.60	$0.90	$0.94	$1.26	$0.93
Truck Percent	15%	15%	15%	15%	15%
2030 AADT[b]	90,200	21,400	35,900	113,800	80,900
Attractiveness of Alternate Routes[c]	Low	High	Med	Low	Med
AADT Retained	80%	25%	50%	80%	65%
2030 AADT Toll	72,200	17,100	28,700	91,000	56,600
Toll Revenue Per Mile (000s)	$3,029	$225	$753	$3,821	$2,207
Total Toll Revenue (000s)	$9,148	$1,015	$3,524	$24,034	$10,240

Source: Cambridge Systematics, Inc., 2005.

[a] Trucks could be charged a single rate of double the auto toll rate, or differential rates that vary by number of axles, but average double the auto toll rate.

[b] AADT: Bidirectional average daily traffic is based on model output.

[c] The attractiveness of alternate routes is a qualitative assessment of the number of parallel routes and the available capacity of those routes.

Table 3.5 shows year 2030 tolling revenue projections based on a $0.20 toll per mile per automobile, which totals $82.3 million for all five segments. The toll could be collected either at specified freeway locations (using manual or electronic toll collection), or be based purely on distance traveled on the freeway (with all-electronic toll collection, an option that will become more common by the year 2030).

Table 3.5 2030 Revenue from Auto Toll of $0.20 per Mile

	Williams Gateway, West	Williams Gateway, East	North-South, North	North-South, South	U.S. 60 Reroute
Segment Endpoint 1	County Line	North-South	U.S. 60	Williams Gateway	Baseline Ave
Segment Endpoint 2	North-South	U.S. 60	Williams Gateway	SR 79	Williams Gateway
Length (Miles)	3.02	4.51	4.68	6.29	4.64
Auto Toll Per Mile	$0.20	$0.20	$0.20	$0.20	$0.20
Truck Toll Per Mile[a]	$0.40	$0.40	$0.40	$0.40	$0.40
Total Auto Toll	$0.60	$0.90	$0.94	$1.26	$0.93
Total Truck Toll	$1.21	$1.80	$1.87	$2.52	$1.86
Truck Percent	15%	15%	15%	15%	15%
2030 AADT[b]	90,200	21,400	35,900	113,800	80,900
Attractiveness of Other Routes[c]	Low	High	Med	Low	Med
AADT Retained	70%	15%	40%	70%	55%
2030 AADT Toll	54,100	12,800	21,500	68,300	32,400
Toll Revenue per Mile (000s)	$5,301	$269	$1,206	$6,687	$3,735
Total Toll Revenue (000s)	$16,009	$1,213	$5,644	$42,061	$17,330

Source: Cambridge Systematics, Inc., 2005.

[a] Trucks could be charged a single rate of double the auto toll rate, or differential rates that vary by number of axles, but average double the auto toll rate.

[b] AADT: Bidirectional average daily traffic is based on model output.

[c] The attractiveness of alternate routes is a qualitative assessment of the number of parallel routes and the available capacity of those routes.

The revenue projections for a HOT lane only approach were not estimated for this report, but are likely to be significantly smaller than the revenue that would be obtained from tolling all lanes. For facilities that have excess capacity, the toll revenue of HOT lanes will be essentially zero. Without a significant time savings, few drivers will choose to pay for the use of the HOT lanes.

Two segments would attract some volumes to the HOT lanes. Both the Williams Gateway, West and the North-South, South have volumes in 2030 that are nearing the capacity of these facilities. These facilities also do not have other parallel facilities that would draw off some of the volumes on these roads. These two segments were modeled as six-lane roads. If a new lane was added as a HOT lane, the diversion to this lane for SOVs (that pay the toll) would be minimal. If one of the lanes in each direction was converted to a HOT lane, this lane would see more significant traffic volumes. For these segments, the HOT lane

might provide as much as 25 percent of the revenue of the fully tolled facility, but additional analysis would need to be conducted.

The toll revenues estimated here assume that the full facilities are open to traffic in 2030. Actual toll collections will depend on the phasing of road implementation and the growth of the areas served by toll.

Operations and Maintenance Costs

The upfront capital costs to introduce tolling are based primarily on changes to the design of the existing roadway (i.e., toll plazas, HOT lane conversions) and the design and installation of the electronic and/or manual toll collection system. In addition to the capital costs, there also will be ongoing operations and maintenance costs associated with tolling which may include some or all of the following elements:

- **Operations**. Staffing toll facilities for revenue collection; staffing service centers for account maintenance and customer service; marketing and distributing transponders; enforcing toll statutes through surveillance; processing toll violations.
- **Maintenance**. Maintaining and repairing toll equipment and toll facilities.

Planning-level capital, operating, and maintenance cost estimates are often based on a concept where fully detailed information may not be readily available. Based on previously completed work in other states, a reasonable estimate of operations and maintenance costs would average 20 cents per toll transaction. This cost estimate is likely to drop over the next 20 years, as new technology is adopted. By the time new toll facilities were to open, the costs may drop to an average of 10 cents per toll transaction (in year 2005 dollars). Depending on the segment, operating costs could consume as much as 50 percent or more of the revenue stream. This is especially true for the low-use facilities, which will have higher costs per transaction due to the fixed nature of some of these costs (such as enforcement, up front technology purchase, and others).

Analysis Assumptions

This tolling revenue analysis is intended to be a preliminary examination of the potential revenue that could accrue from a toll road. As such, it is based on several assumptions, including the following:

- **Vehicle classification**. Fifteen percent of vehicles are assumed to be trucks. This is based on existing state traffic counts in the study area. Additional vehicle classification counts by time of day and season would be needed to better understand the response of truck drivers to toll roads. Because many trucks travel off-peak, they may be more inclined to use alternate routes, even if they are longer. This is especially true for heavy trucks carrying low-value commodities.

- **Truck toll rates**. Truck toll rates are assumed to be double auto toll rates. In most cases, truck toll rates vary by number of axles. Averaged across all types of trucks, twice the automobile rate is a typical means used to capture the greater impact that heavy vehicles have on the roadway.
- **Demand impact**. Tolls inevitably reduce the demand for a road. People chose alternate routes and forego some trips to avoid paying tolls. A diversion rate was identified for each segment based on the relative attractiveness of parallel arterials and experience with similar analyses in other states. Diversion rates are much higher for segments that have capacity available on parallel routes than in more congested areas. A more complete analysis would estimate the actual diversion expected using a travel demand model that could estimate peak and off-peak travel on these facilities. Multiple model runs would be used to identify the expected diversion for various toll levels.

A complete analysis would provide better estimate for these and other assumptions required. In addition, it could evaluate the best locations for toll roads in the State. Toll roads lanes are rarely developed on new or planned facilities. Recent examples of toll facilities in the United States have been built in highly congested corridors or by converting HOV lanes that are underused (but on an otherwise congested corridor) to HOT lanes. A more comprehensive analysis of toll roads would require additional effort, but could provide the State with a better understanding of the most appropriate locations for toll roads in Arizona.

3.6 DEBT FINANCING

In addition to options that generate new revenue, the use of debt financing also is a possibility in order to accelerate the construction of transportation projects in Arizona. Some of the main options for debt financing in Arizona are:[23]

- **HURF Bonds.** The Arizona State Transportation Board may issue HURF bonds to accelerate the construction of highway projects in the State. The pledged revenues for the bond issues are the HURF funds deposited in the State Highway Fund. The bonds are an obligation of the State Transportation Board and are not obligations of the State of Arizona. They do not constitute a legal debt of the State, and payment is not enforceable from any revenue other than HURF.
- **RARF Bonds.** The State Transportation Board may issue RARF bonds to accelerate the construction of controlled access facilities for the Maricopa Regional Freeway System. The pledged revenues for the bond issues are the Maricopa County Transportation Excise Tax revenues deposited in the

[23]http://www.azdot.gov/inside_ADOT/fms/fundsource.asp.

RARF. The bonds are an obligation of the State Transportation Board and are not obligations of the State of Arizona. They do not constitute a legal debt of the State, and payment is not enforceable from any revenue other than RARF.

- **Highway Expansion and Extension Loan Program (HELP).** This was enacted on August 21, 1998. HELP is Arizona's State Infrastructure Bank, which provides loans and financial assistance for eligible highway projects in Arizona. The HELP fund is capitalized with Federal and state dollars, as well as Board Funding Obligations that provide the capital for loans. As borrowers repay principal and interest on loans, the HELP fund is replenished and monies can be re-loaned. The fund is a self-sustaining mechanism to accelerate critical transportation projects.
- **Grant Anticipation Notes (GAN).** Enacted into law in 1984, GANs offer a significant opportunity for accelerating transportation projects throughout Arizona. GAN legislation enables the State to issue notes to pay the Federal share of projects in advance of the actual receipt of Federal highway funding. Local communities participate in paying the cost of interest on the notes.
- **Board Funding Obligations (BFO).** The State Transportation Board has the authority to issue nonnegotiable BFOs for purchase by the Arizona State Treasurer. The BFOs were initially used to capitalize Arizona's State Infrastructure Bank, which allowed the Department and political subdivisions to apply for loans from HELP. However, Laws 2001, Chapter 238 (HB 2636) provided additional authority to the Board to issue BFOs for the State Highway Fund for up to $60 million in FY 2002 and FY 2004.
- **Transportation Infrastructure Finance and Innovation Act (TIFIA).** A new Federal program that consists of three distinct types of financial assistance, designated to address various project requirements throughout a project's life cycle:

  a. Secure loans are direct Federal loans to project sponsors offering flexible repayment terms and providing combined construction and permanent financing of capital costs;

  b. Loan guarantees provide full faith-and-credit guarantees by the Federal government; and

  c. Federal government Stand-by Lines of Credit represent secondary sources of funding in the form of contingent Federal loans.

4.0 Conclusions and Next Steps

Securing adequate funding for the recommended Pinal County freeway corridors in the Corridor Definition Studies of over $2 billion will likely require a combination of several Federal, state, and county/local funding sources. The use of debt financing mechanisms also may be necessary. The general outlook on the availability of these funding sources through the year 2030 is as follows:

- **Federal.** Arizona is projected to more than double in population from the year 2000 (5.1 million) to 2030 (10.7 million).[24] This would move Arizona from the 20th most populated state in the nation to the 10th, ahead of Michigan and just behind Ohio.

  As a percent of the nation's population, Arizona is projected to increase from 1.82 percent in the year 2000 to 2.95 percent in 2030. This should increase Arizona's relative share of contributions to the Highway Trust Fund and result in significantly more Federal highway funds going to Arizona over time. It is unknown how Federal funding legislation will change in the future. In recent history, Federal funding for transportation has grown significantly, but changing technology and fuel efficiency and inflation will all contribute to erode the purchasing power of the Highway Trust Fund. Even if funding continues to increase, it is not clear how much of Arizona's Federal dollars could be programmed for the Pinal County corridor projects. Significant portions of Federal funding are reserved for specific programs (such as Interstate Maintenance) and, as a growing state, Arizona has numerous transportation needs.

- **State.** HURF and vehicle license tax (VLT) revenue will increase significantly between now and 2030, as Arizona's population continues to grow. However, only a small percentage of each funding source currently goes towards highway projects in Pinal County. If this percentage increases in the future, funding from the State may be a more significant source of funds for the Pinal County corridor projects. Like the Federal highway trust fund, however, inflation and alternative fuels and technology will cut into the value of the HURF.

- **County/Local.** The one-half-cent Pinal County excise tax, which generated nearly $10 million for the County in 2004, will be an extremely important revenue source for transportation projects. However, as Pinal County grows, it will have significant local transportation needs, such as new arterials and local streets, that will compete for these funds.

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[24] http://www.azdot.gov/inside_ADOT/fms/fundsource.asp.

The potential funding sources discussed in Section 3.0 (increased use of general tax revenue, transportation-dedicated property tax, benefit assessment districts, traffic impact fees, tolling) are all options for Pinal County to consider. It will take some time and political support for these possibilities to materialize. Four cities in Pinal County have either implemented or currently are considering transportation development fees (i.e., impact fees), making this a feasible option for consideration at the countywide level.

Table 4.1 shows year 2006-2030 cumulative funding projections for the funding sources that are potentially relevant to the Pinal County corridor projects. Current funding sources that are not dedicated to transportation (i.e., general sales tax, income tax, and property tax revenue) are not shown in the table. The projections are intended to be order of magnitude projections and should be used for general planning purposes only.

Table 4.1 Funding Orders of Magnitude

Type of Funding	Category	Existing or Potential	Estimated Funds: Statewide: 2006-2030 ($ Billions)	Estimated Funds: Pinal County: 2006-2030 ($ Millions)
Federal	National Highway System	Existing	$3.8	$170
	Surface Transportation Program	Existing	$3.9	$180
	Equity Bonus	Existing	$8.1	$360
State	HURF – State Highway Fund	Existing	$29.0	$1,300
	HURF – to Counties	Existing	$10.9	$610
	HURF – to Cities/Towns	Existing	$17.5	$450
	VLT – Counties for Highways	Existing	$3.0	$230
	Total: Federal and State	**Existing**	**$76.2**	**$3,300**
Local	Pinal Half-Cent Sales Tax[b]	Existing	N/A	$1,180
Total: Existing Categories		**Existing**	**Not estimated**	**$4,480**
Local	Pinal 0.3% Property Tax	Potential	N/A	$290
	Pinal Ben. Assess. Districts	Potential	N/A	N/A
	Pinal Traffic Impact Fee	Potential	N/A	$700
	Pinal Toll Facilities	Potential	N/A	[a]
Total: Potential Categories		**Potential**	**Not estimated**	**$990**
Total: Existing and Potential		**Both**	**Not estimated**	**$5,470**

Source: Cambridge Systematics. Dollar values are in year of expenditure dollars.

[a] Tolling cannot begin until the facilities have been constructed. In 2030, a toll of $0.20 per mile for autos is expected to produce around $80 million.

[b] Revenue estimates for the Pinal half-cent sales tax have been inflated to year of expenditure dollars at a rate of 2 percent per year.

The funds for the recommended Pinal County corridors may be needed earlier than the year 2030. Also, the dollars shown in Table 4.1 need to be made available for a variety of transportation purposes, not just the recommended corridors. Clearly, renewing the one-half-cent transportation sales tax in Pinal County will be important. Securing sufficient Federal and state transportation funds for Pinal County also may be important. The use of potential new transportation funding sources, general tax revenues, and debt financing are other options to consider.

The total amounts available by source were estimated as follows:

- **Federal programs.** The FHWA identifies funding levels through 2009, assumed to be in year of expenditure dollars.[25] The 2010 to 2030 projections assume 1.61 percent annual growth, based on the 2005 to 2009 growth trend. Arizona's share of the national total is assumed to grow over time by program as its share of the national population grows. NHS funding is expected to grow from 1.83 percent in 2009 to 2.55 percent in 2030. The STP program is assumed to grow from 1.76 percent in 2009 to 2.45 percent in 2030. Arizona's share of the equity bonus is expected to grow from 2.61 percent in 2009 to 3.64 percent in 2030. These growth rates are based on U.S. Census data. Pinal County's share of the State total is assumed to be an average of 4.5 percent annually for this analysis. This share may change as Pinal County grows.
- **HURF.** ADOT provided HURF projections through the year 2030, in year of expenditure dollars. The percentage of HURF going to the State Highway Fund, cities, and counties (after taking $40,000 per year off the top) is assumed to remain at the present statutory allocations. Pinal County's share of the State Highway Fund total is assumed to be an average of 4.5 percent annually. For county HURF funds, Pinal County's share is assumed to be 5.6 percent. For city/town HURF funds (excluding the funds that go directly to cities with a population of over 300,000), Pinal County's share is assumed to be 2.85 percent. As with the Federal programs, the Pinal County shares may change over time.
- **VLT.** ADOT provided county highway VLT projections through the year 2030 in year of expenditure dollars, which appear to take into account escalation of the VLT fee structure over time. Pinal County's share of the state total is assumed to be an average of 7.7 percent annually, based roughly on the share received in 2005. Again, VLT distributions to the county may change over time.
- **Local sources.** Methodology for each of the local sources is described in detail above.

[25] http://www.fhwa.dot.gov/safetealu/fundtables.htm.